

What is Claimed is:

1. A method for fabricating a capacitor, comprising the steps of:

5       a) forming a lower electrode on a semiconductor substrate;

          b) forming a dielectric layer on the lower electrode;

          c) loading the semiconductor substrate containing the dielectric layer into a deposition chamber;

10       d) nitriding a surface of the dielectric layer while  $\text{NH}_3$  gas is flowed into the deposition chamber; and

          e) forming an upper layer by using a source gas  $\text{NH}_3$ , containing Titanium (Ti) on the nitrated surface of the dielectric layer through an atomic layer deposition (ALD)

15   method.

2. The method as recited in claim 1, wherein the step d) is performed on condition that the source gas  $\text{NH}_3$  is flowed in at a flow rate of about 300 sccm to about 1000  
20   sccm for about 10 seconds to about 120 seconds.

3. A method for forming a capacitor capable of preventing  $\text{TiCl}_4$  gas from being exposed to a dielectric layer by controlling at least one of a  $\text{TiCl}_4$  flow rate and  
25   a  $\text{TiCl}_4$  feeding time while continuing a series of cycles for performing a atomic layer deposition (ALD) process, the method comprising the steps of:

a1) loading a semiconductor substrate containing a dielectric layer formed on a lower electrode into a deposition chamber; and

b1) forming an upper electrode containing Titanium (Ti) on the dielectric layer through an atomic layer deposition (ALD) method using a source gas  $\text{NH}_3$ .

4. The method as recited in claim 3, wherein the  $\text{TiCl}_4$  flow rate is controlled by opening a valve for a  $\text{TiCl}_4$  feeding process or by-passing  $\text{TiCl}_4$  gas outside of the deposition chamber after opening the valve prior to starting the  $\text{TiCl}_4$  feeding process.

5. The method of claim 4, wherein the  $\text{TiCl}_4$  gas is flowed in at a flow rate of about 10 sccm to about 50 sccm.

6. The method as recited in claim 3, wherein the  $\text{TiCl}_4$  feeding time is mandated to be timed, wherein initial 50 cycles lapse for about 0.05 seconds to about 0.2 seconds and the rest lapses for about 0.5 seconds to about 0.2 seconds.

7. The method as recited in claim 3, wherein step b1) further includes the steps of:

a2) absorbing the  $\text{TiCl}_4$  onto the dielectric layer by feeding the  $\text{TiCl}_4$ ;

b2) feeding the  $\text{TiCl}_4$  gas in order to make it

absorbed on the dielectric layer;

c2) purging a remnant of the  $\text{TiCl}_4$  gas remaining after the absorption;

d2) feeding  $\text{NH}_3$  gas on a surface of the dielectric  
5 layer on which the  $\text{TiCl}_4$  is already absorbed; and

e2) purging a remnant of the  $\text{NH}_3$  gas and a by-product which is formed by a chemical reaction between the  $\text{NH}_3$  and the  $\text{TiCl}_4$ .